film with a thickness of 5 nm is formed thereon. The Au film is provided to prevent degradation of a surface of the EL layer in later steps. Then an anode is formed on the Au film from a compound of indium oxide and tin oxide (ITO) to complete the EL element.

If a pin hole is opened and a defect portion is formed in the light emitting layer of the EL element structured as above, the Pb layer that is the cathode is undesirably brought into contact with the PEDOT layer that is the hole injection layer in the defect portion.

When a reverse bias current is caused to flow in the EL element having the defect portion at given time intervals, the temperature in the defect portion is raised so that the defect portion is burnt out, vaporized, or oxidized or carbonized to be transformed into an insulator. As a result, the defect portion is changed into the transmuted portion to increase the resistance thereof. Therefore degradation of a part of the EL layer that surrounds the transmuted portion is not accelerated.

Light emitted from this EL element utilizes singlet excitation energy from the singlet compound.

With the above structure, the present invention can increase the amount of current actually flowing through the EL layer upon application of a forward bias voltage to the EL element even if a pin hole is formed in the EL layer during formation of the layer due to dusts or the like and two layers sandwiching a light emitting layer short-circuit, because the method can raise the resistance of the defect portion where the short circuit takes place by changing the defect portion into the transmuted portion. Therefore the repairing method of the present invention can raise the luminance of emitted light with application of the same level of voltage despite the presence of the defect portion.

Furthermore, the invention can prevent accelerated degradation in a part of the EL layer that surrounds the defect portion by changing the defect portion into the transmuted portion to increase the resistance thereof.

A carbide generated by carbonization of an EL material is high in insulating property and is stable as a substance. For that reason, the repairing method of the present invention is particularly effective when the defect portion is filled with an organic EL material, for example, when the defect portion is formed in an EL layer that is in contact with an EL material film.

This embodiment may be combined freely with Embodiments 1 through 4.

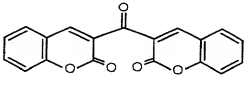
[Embodiment 6]

In this embodiment, an external light emitting quantum efficiency can be remarkably improved by using an EL material by which phosphorescence from a triplet exciton can be employed for emitting a light. As a result, the power consumption of the EL element can be reduced, the lifetime of the EL element can be elongated and the weight of the EL element can be lightened.

The following is a report where the external light emitting quantum efficiency is improved by using the triplet exciton (T. Tsutsui, C. Adachi, S. Saito, Photochemical Processes in Organized Molecular Systems, ed. K. Honda, (Elsevier Sci. Pub., Tokyo, 1991) p. 437).

The molecular formula of an EL material (coumarin pigment) reported by the above article is represented as follows.

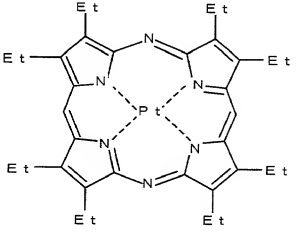
(Chemical formula 1)



(M. A. Baldo, D. F. O' Brien, Y. You, A. Shoustikov, S. Sibley, M.E. Thompson, S. R. Forrest, Nature 395 (1998) p.151)

The molecular formula of an EL material (Pt complex) reported by the above article is represented as follows.

(Chemical formula 2)



(M. A. Baldo, S. Lamansky, P. E. Burrows, M. E. Thompson, S. R. Forrest, Appl. Phys. Lett., 75 (1999) p.4.) (T. Tsutsui, M.-J. Yang, M. Yahiro, K. Nakamura, T. Watanabe, T. Tsuji, Y. Fukuda, T. Wakimoto, S. Mayaguchi, Jpn, Appl. Phys., 38 (12B) (1999) L1502)

The molecular formula of an EL material (Ir complex) reported by the above article is represented as follows.

(Chemical formula 3)